

Zero Retries issue 0049 2022-06-03

Technological innovation in Amateur Radio - Data Communications; Space; Microwave... the fun stuff! The Universal Purpose of Ham Radio is to have fun messing around with radios - Bob Witte K0NR. Ultimately, amateur radio must prove that it is useful for society - Dr. Karl Meinzer DJ4ZC. We are confronted by insurmountable opportunities! - Pogo. Nothing great has ever been accomplished without irrational exuberance - Tom Evslin. Irrational exuberance is pretty much the business model of Zero Retries Newsletter - Steve Stroh N8GNJ. What's life without whimsy? - Dr. Sheldon Cooper.

Zero Retries is a unique, quirky little highly independent, opinionated, self-published email newsletter about technological innovation in Amateur Radio, for a self-selecting niche audience, that's free (as in beer) to subscribe.

About Zero Retries

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Request To Send

As I begin this issue, I'm blissfully back in Bellingham, Washington... briefly... writing this on my big desktop system, with the full size clicky keyboard, big trackpad, and best of all, the 65" HiSense monitor that I've grown to love for ease of editing by being able to display multiple full-size windows that I merely have to flick my eyes to view, instead of panning my head to view multiple monitors, or squint to see tiny text on "mere" 27 inch monitors. The one downside to my office is that my Internet connection is a cable modem in our house, and my office is in the shop, and the connection between the two is a set of AC modems that for some reason, doesn't work as well when it rains, like as I type this. One of my many projects this summer is to try to pull fiber through a partially occupied conduit... but it will probably end up being Cat5E Ethernet.

As this issue auto-publishes, my wife Tina KD7WSF and I will be attending [SEA-PAC](#) in Seaside, Oregon on

June 3-5, 2022. SEA-PAC is a regional Amateur Radio convention for the (US) Pacific Northwest, complete with commercial exhibitors, seminars (forums) and a flea market, all crammed into a small (but recently expanded) [convention center](#) in Seaside. In my personal circle, only about half of the usual attendees at SEA-PAC have stated that they'll be attending. Seaside hotel prices were always high, but this year they're approaching absurd / ridiculous / obscene at some hotels, and of course gas prices are a factor for many, especially the retired generation that are the majority of SEA-PAC attendees.

Amateur Radio friends recommended SEA-PAC and we attend starting decades ago, and it's become a family tradition, to the point where Tina and I spent three punishing days to get back to Bellingham from our big trip in time to unpack and repack to attend SEA-PAC. Our only plans for the summer after SEA-PAC is to enjoy Bellingham's glorious summer.

Like Hamvention, I have no firm plans for SEA-PAC for vendors to see or people to talk to other than some old techie friends that I hope to visit with over beers at a [favorite tavern](#) on the Necanicum River that empties into the Pacific Ocean at Seaside. But, like happened at Hamvention, I'm sure I will encounter interesting people I didn't expect, see at least a few things I didn't anticipate, and have interesting conversations that I never could have imagined.

I do have photos from Hamvention, and I haven't decided how to present them. Perhaps a special issue of Zero Retries with just photos and captions.

The next issue of Zero Retries - 0050 is planned, for now (as promised in Zero Retries 0040) as another decadal compilation of "Zero Retries Interesting" products, products, etc. to help "level set" new Zero Retries readers.

de Steve N8GNJ

Hamvention Attendance

Hamvention's official tally of attendance was 31367. That feels... overstated... to me. I have no experience at judging crowd size, but I did attend all three days of the first Hamvention at the Greene County Fairgrounds in 2017 and I remember what that crowd was like. A quick websearch found [this page](#) which states that the official Hamvention attendance in 2017 was 29296, and that was, of course, pre-COVID-19. At Hamvention 2022, it just didn't *feel*, to me, like there were 31367 of us during all three days of Hamvention 2022. Hamvention could have easily sold 31367 *tickets*... (advance tickets were \$26 and onsite tickets were \$31) and there may have ended up being a significant number of last minute no-shows that just decided not to chance COVID-19, or gas prices were too high, or there weren't (enough) sexy new radios to see and touch. It was also notable that there was a distinct lack of staffing at gates, etc., of both volunteers, and paid security personnel. Thus in my opinion there was no way that actual attendees *could* have been *actually counted*.

Thus, given the gaps in the Forum seating, the very light crowding in the exhibit areas (except for the peak hours around Noon on Saturday), and the sparse crowds in the Flea Market, it's my *personal, highly unprofessional, likely very incorrect feeling*, again based mostly on what I experienced in 2017 versus what I experienced in 2022, that the actual number of unique physical bodies on the grounds of Greene County Fairgrounds over the course of the 3-day weekend... was closer to 20000 than 31367.

Not Much Digital / Data - That's a Problem

First, the idea I floated in Zero Retries 0047 of a Zero Retries exhibit at Hamvention 2023 elicited no response from Zero Retries readers. Nada. Zilch. Zip. Lead balloon. That doesn't mean the idea is dead, just that it won't be a "community supported" project like I discussed.

As I mentioned in Zero Retries 0048, at Hamvention 2022, I didn't see much evidence of Digital / Data in Amateur Radio other than a few notable exhibits such as TAPR, M17 Project (hosted by Bruce Perens K6BP), K6BP's new organization [HamOpen](#), K6BP's [\\$14 Remote Rig Controller project](#), and of course Icom (as

discussed in Zero Retries 0048). FlexRadio is a notable exception with their product line being entirely based on Software Defined Radio technology and thus everything FlexRadio makes is Zero Retries Interesting.

I think that lack of digital / data exhibits is a significant problem because without such “in person” exhibiting, one could reasonable infer, especially new Amateur Radio Operators excited to attend their first Hamvention, that “nothing much” is happening with Amateur Radio data. For example, there was no presence of AREDN, despite that AREDN networks are growing quickly. (A “back channel” communication after Zero Retries 0047 hinted that AREDN may appear at a future Hamvention.)

Another significant “data” organization that I think should exhibit at Hamvention is Amateur Radio Safety Foundation, the parent organization of the [Winlink Amateur Radio email system](#). Winlink is the major data activity on VHF / UHF and should be represented. APRS used to be well-represented as part of the TAPR booth, but I couldn’t even find any APRS trackers being sold, let alone advocacy of APRS.

I hope Digital / Data will be better represented at future Hamventions. Let me know if I can help.

ARISS-USA Forum

I’ve mentioned here in Zero Retries, and as often as I can in conversations, that one of the proudest boasts I can make as an Amateur Radio Operator is that there is an Amateur Radio station on the International Space Station (more than one actually - see ZR > BEACON below), and it’s used by Astronauts that are Amateur Radio Operators, and their primary activity with the station is to contact kids in schools to inspire them to study STEM (Science, Technology, Engineering, and Math) subjects... and of course, a small dose of Amateur Radio.

I was encouraged when ARISS-USA spun itself out of being supported by AMSAT-NA and ARRL into an independent organization that continues to work with both AMSAT-NA and ARRL on matters of mutual interest, but (as I understand it) ARISS-USA is no longer dependent on those organizations for core functions, especially financial. As a standalone organization with a US 501(c)(3) certification, individuals and organizations can donate specifically to support ARISS activities rather than “pass through” donations via AMSAT-NA or ARRL.

I attended ARISS-USA’s presentation at Hamvention 2022 - **ARISS 2.0: A Next Generation Vision for Amateur Radio on the ISS**. I was very, very impressed with their activities. They are energized with their [major 2021 grant from ARDC](#) and appear poised to make good use of it. Seriously, the presentation was just so upbeat that I left it energized. Presenters Frank Bauer KA3HDO, Randy Berger WAØD, Rosalie White K1STO, and Diane Warner KE8HLD did a great job.

What amazed me was the sheer magnitude of the schedule of contacts for ARISS. From what I have read about ARISS, my impression was that there were a few dozen contacts per year. Actually, there are many, many more than that.

I saw recording equipment in various Forums, but wasn’t aware that Hamvention was the organization actually doing the recording and putting the presentations on YouTube, thus you can watch the entire presentation for yourself:

I visited the ARISS-USA exhibit and spoke with KA3HDO and K1STO and offered my gratitude for what they're doing. ARISS-USA is just amazing. I got to see the Engineering Test Article of the specially modified Kenwood TM-D710GA radio and power supply, identical to the unit (now *units* - see ZR > BEACON below) onboard the ISS.

Just to clear up any confusion, the 2021 ARDC grant to ARISS-USA was to fund a *specific program*, not general ARISS operations. Thus, ARISS-USA continues to need financial contributions to fund their ongoing activities, and especially volunteers to help manage all those contacts. I recommend ARISS as one of the best investments you can make for insuring Amateur Radio has a future.

Disclaimer - I was on the 2021 ARDC Grants Advisory Committee when ARISS-USA's grant was considered. The views expressed here my own; I do not speak for ARDC, and they don't speak for me.

TAPR Forum

I also attended the TAPR Forum at Hamvention 2022. There's renewed energy at TAPR with new projects (some [funded by ARDC grants](#)).

The presenters were Scott Cowling WA2DFI, John Ackermann N8UR, John Hays K7VE, and Nathaniel Frissell W2NAF (the YouTube description, apparently supplied by Hamvention, is not accurate).

One new detail was that the [2022 ARRL and TAPR Digital Communications Conference \(DCC\)](#) may be held in person... or may (like the 2020 and 2021 events) held virtually - TAPR has not yet decided. If it is held in person it will be in Charlotte, North Carolina, USA.

One of the things WA2DFI mentioned in passing is that TAPR now has "[WSPR Kits](#)" for *all* Amateur Radio HF bands - 160 meters (1.8 - 2.0 MHz) through 10 meters (28.0 - 29.7 MHz). These are small boards that mate with a Raspberry Pi (Hardware Attached on Top - HATs) and provide minimal filtering and very minor amplification for the chosen band. The "magic" of generating a WSPR signal is done entirely in software on the Raspberry Pi. Thus a "Software Defined Transmitter" (kind of novel...) combined with the familiar and capable Raspberry Pi computers makes for an unusually interesting project for a new Amateur Radio Operator.

The 10 meter version is specifically interesting because 10 meters can be used with [manageable sized antennas](#), and it's a band with occasional HF (like) propagation that [US Amateur Radio Technician class operators can use](#). Thus if you want to expose an Amateur Radio operator with a Technician class license to the wonders of HF operation, WSPR on 10 meters should be an easy and fun way to do so without the (sometimes not-so-subtle) pressure to upgrade their Amateur Radio license to General. I was able to purchase two 10 meter WSPR boards at the TAPR booth - one of the few purchases I made at Hamvention. I think this will be a project for my daughter Merideth KK7BKI and I; we'll set one up at each of our homes (she lives in an apartment, but does have a balcony) and see which of our locations works better with the same system - same Raspberry Pi, same antenna, etc.

WA2DFI talked about the status of various TAPR projects, mostly the [Tangerine SDR](#), and the workarounds they've had to do because of the ongoing chip shortage that has especially impacted "hobby" type projects such as TAPR's projects.

N8UR talked about the SynthDO GPS Disciplined Oscillator Project. More and more Amateur Radio systems benefit from an accurate timebase, so this was of more interest than usual to me. N8UR mentioned that a follow-on to the current version of this project will be a "Time Nuts" version with even more inputs and outputs.

K7VE gave an overview of ARDC's activity and encouraged folks (especially this audience, interested in what TAPR is doing) to apply for ARDC grants and what ARDC looks for in a grant proposal.

W2NAF talked about "Traveling Ionospheric Disturbances", one of the activities of [HamSCI](#). One of my regrets at Hamvention 2022 is that I didn't make time to visit the HamSCI booth; that's my loss because they are one of the most energetic groups at Hamvention, and spending even a few minutes with them just energizes you. As with the ARISS-USA Forum, watch for yourself:

Disclaimer - I was on the 2021 and 2022 ARDC Grants Advisory Committee when TAPR's grants were considered. The views expressed here my own; I do not speak for ARDC, and they don't speak for me.

SDRplay's Stealth Exhibit at Ham Radio Outlet Exhibit

SDRplay's Software Defined Receivers are one of my favorites for high performance at reasonable cost, and they're my primary recommendation when I'm asked about SD Receivers. I managed to miss SDRplay at Hamvention 2022 as they were not on the official Hamvention exhibitor list so I didn't know to look for them. Argh!

Oh well, like you other non-attendees, I can catch up on the latest developments from SDRplay, presented at Hamvention 2022, via YouTube:

Since I have no firsthand knowledge, here's the description from [an article](#) of what SDRPlay demonstrated at Hamvention 2022:

At Hamvention in Dayton, Ohio, SDRplay demonstrated the core underlying technology behind "SDRconnect". "SDRconnect" will be the new name for the multiplatform version of SDRuno (up till now we called it SDRuno V2).

At Dayton, SDRplay demonstrated the completely rewritten Core DSP engine for Spectrum and Waterfall displays – with the prototype software running on a Mac M1 computer. We are also showing the networking capability by remotely accessing an RSP based in the UK. This is still an early stage demo, and the software team have a lot to do to complete the graphical user interface. Work is underway on the new graphical user interface which: Retains the style and popular features of SDRuno Offers a more consistent and intuitive layout Addresses fixes and improvements suggested by users ever since SDRuno was first adopted. SDRplay plans to release the first version of SDRconnect before the end of 2022. SDRplay is planning that SDRconnect will fully support the older obsolete RSP2 and RSP2pro products, although the original RSP1 (phased out in 2017) cannot be supported by SDRconnect. (SDRuno V1.42 will continue to be available for RSP1 users). The new graphical user interface will bring a lot of advantages based on what users have been asking for – like more consistency in the way panels and menus are organised making it more intuitive and easy to use, and the ability to lock panels together.

One of the few complaints I've heard about SDRplay's products is that their supplied software is... (hopefully soon that gets modified to *was*) Windows-centric - glad to hear that's being fixed.

M17 Project Developments

At Hamvention 2022, [M17 Project](#) was represented at the Bruce Perens K6BP / HamOpen.org exhibit by Ed Wilson N2XDD (a Zero Retries reader!). One mystery that got cleared up about M17 being simultaneously “sponsored” by HamOpen.org and Open Research Institute (ORI) was that ORI chose not to attend Hamvention 2022, and K6BP thought that M17 Project *should be present* at Hamvention 2022, so K6BP extended an invitation to M17 Project to exhibit at his exhibit table and N2XDD accepted on behalf of M17 Project. They showed off some cool stuff.

[Module 17](#) is a built-for-purpose hardware module:

This project provides a standalone *smart microphone* that transforms any 9600 baud capable transceiver into an [M17](#) compatible radio. It is based on a STM32F4 microcontroller and is designed to run the [OpenRTX](#) firmware. Audio and PTT connectivity is given through a "Kenwood 2 Pin" compatible connector (2.5 and 3.5mm audio jacks).

According to N2XDD, Module 17 is pretty close to “good enough” to use to start doing experimental M17 digital voice if you have access to any data radio that has a flat audio connection. N2XDD said that M17 Project’s hope is to condense Module 17 into the form factor of a handheld Push-to-Talk microphone. I offered feedback that, in my opinion, Module 17 was good enough and I would buy a pair if they were made available. In fairness, being an open source project, I’ll guess that all the relevant information is available to build your own Module 17... I’m just saturated with projects at the moment, and putting together my own Module 17 from disparate parts is, at the moment, one project too many.

A second item being exhibited by M17 Project was a portable radio that had been modified with [OpenRTX](#) firmware, and some very minor hardware mods (but involving surface mount components, so not quite “easy”). If I understood things correctly, you could talk between Module 17 + “flat audio connection” radio and a portable radio running OpenRTX firmware - all via the M17 open source protocol plus open source digital voice CODEC (CODEC2).

A third demonstration was an implementation of a MMDVM hat that incorporates M17.

These developments finally feel, to me, like tangible progress for the M17 Project and it looks like M17 on-the-air activity, for experimenters, could begin soon. Here’s the now obligatory YouTube video from Hamvention 2022:

ZR > BEACON

- **Second ARISS Interoperable Radio System Installed On-Board ISS** Speaking of ARISS... *On May 25, 2022, Roscosmos cosmonaut Oleg Artemyev installed new amateur radio equipment on the Russian segment of the International Space Station (ISS) — a Kenwood TM-D710GA transceiver. The transceiver was delivered on February 17, 2022 on the Progress MS-19 cargo ship. Artemyev successfully dismantled the old amateur radio equipment and installed the new equipment. Tests are expected in the coming days. Thanks to [AMSAT News Service Bulletin 2022-05-28, ANS-149](#).*

- **[44Net Assessment – Give Us Your Thoughts!](#)**

44Net has been around since the 1980s, allowing amateur radio operators to experiment (and more!) with internet routing, for free. The world has changed a lot since then, but technologically speaking, 44Net has remained pretty much the same. Is that OK or is it time for an upgrade? To figure this out, we are taking the time to understand how 44net is being used.

The consulting firm [TwoP](#) is spearheading this assessment. The first step is collecting information via a [survey](#), which will poll as many existing and potential new users as possible. If you have thoughts about 44Net and its future, [please share them!](#) And feel free to send the survey to anyone you think we should hear from.

We'll also be conducting interviews and focus groups with a subset of users to get more detailed information than the survey can provide. All together, this assessment will help us to determine where and how to further develop 44Net. If you are interested in participating in the focus groups, please email contact@ardc.net.

Results from the research will, of course, be shared publicly (personal information excluded) on our website.

Feedback Loop

- **Greg Hancock AE7EL:** *You've been asking about affordable SDR transceivers suitable for amateur VHF/UHF/microwave use. I'm a fan of the Ettus boards, but the LimeSDR family offers cheaper options with roughly similar performance to the lower end Ettus stuff. After experiencing supply problems for the past two years, the new LimeSDR Mini 2.0 is up for order. Check out the specs and price point. The driver is not (or wasn't) quite as stable as the Ettus driver, but it does work (I tested the original LimeSDR Mini) and the price is right.*

<https://www.crowdsupply.com/lime-micro/limesdr-mini/updates/limesdr-mini-2-0-is-now-live>

Greg - thanks for this good news! I knew the LimeSDR Mini was being redesigned to use even more modern and capable components, but I didn't imagine it would be available this quickly.

- **Tim Stewart KG4BX on ZR 0048:** *I enjoy reading Zero Retries each week, thanks for writing them! The Kenwood TH-D74A does implement Fast Data mode--I've used it myself. You can switch it on by selecting "Data Mode" in the Digital Function menu (Fn -> MODE (DIGITAL)). See page 16-9 in the TH-D74A manual for details. I done a reasonable amount of experimentation with Fast Data, and my understanding is that all radios released by Icom *since* the ID-51A also have Fast Data support. This includes at least the ID-4100, the ID-52, and the IC-9700. I would be quite surprised if the SHF-P1 supports D-Star and doesn't also support Fast Data. This would be a weird step backwards. I suppose we'll see.*

I should say I don't actually know which of the ID-51As introduced Fast Data. I did my testing on a PLUS2, until I sold it ahead of getting an ID-52. (I considered keeping it for compatibility testing, but it got too good of a price on eBay :) Another interesting detail: the TH-D74A lacks the ability to switch from Fast Data to Slow Data on the fly when you are transmitting data and press PTT to talk via voice. This appears to be an Icom exclusive feature, for now.

Thanks again for the great content!

Tim - Thanks for the kind words about Zero Retries. You are, of course, completely correct. My statement that the TH-D74A doesn't implement DV Fast Data Mode was totally in error. Thanks for the feedback!

Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out

Join the Fun on Amateur Radio for some pointers.

Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with wireless technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to anyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing *Thanks* to:

- Tina Stroh KD7WSF for, well, *everything*!
- Pseudostaffer [Dan Romanchik KB6NU](#) for continuing to spot, and write about "Zero Retries Interesting" items on his blog that I don't spot on my own.
- [Southgate Amateur Radio News](#) consistently surfaces "Zero Retries Interesting" stories.
- The [Substack email publishing platform](#) makes Zero Retries possible. I recommend it for publishing

newsletters.

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More bits from Steve Stroh N8GNJ:

- [SuperPacket blog](#) - *Discussing new generations of Amateur Radio Data Communications - beyond Packet Radio (a precursor to Zero Retries)*
- [N8GNJ blog](#) - *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs - Bellingham, Washington, USA*

Thanks for reading!

Steve Stroh N8GNJ / WRPS598 (He / Him / His)

These bits were handcrafted in beautiful Bellingham, Washington, USA

2022-06-03

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